REPORT DOCUMENTATION PAGE

AFRL-SR-BL-TR-02-

05068

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REP
	FINAL	01 JUN 1997 - 31 DEC 2000

4. TITLE AND SUBTITLE
MODELING MULTISTRATEGY LEARNING AS A DELIBERATIVE PROCESS OF PLANNING

5. FUNDING NUMBERS
F49620-97-1-0279

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8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
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801 N. RANDOLPH STREET, ROOM 732
ARLINGTON, VA 22203-1977

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
F49620-97-1-0279

11. SUPPLEMENTARY NOTES

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH (AFOSR)
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12a. DISTRIBUTION AVAILABILITY STATEMENT
APPROVED FOR PUBLIC RELEASE, DISTRIBUTION UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

In July, we presented work related to the ARL project at two conferences. The first presentation at SCI-98 in Orlando, Florida discussed our use of visualization techniques to develop, refine, and evaluate varius algorithms during the different stages of the project. The second presentation concerned our initial successes using qualitative representations to recognize patterns of movement in NTC battle data and was made at the annual conference of the American Association of Artificial Intelligence (AAAI), one of the largest AI forums. Much of the first months of the project was spent preparing the final revisions for publication.

20020305 083

14. SUBJECT TERMS	15. NUMBER OF PAGES
	1
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

Final Report

In July, we presented work related to the ARL project at two conferences. The first presentation at SCI-98 in Orlando, Florida discussed our use of visualization techniques to develop, refine, and evaluate various algorithms during the different stages of the project. The second presentation concerned our initial successes using qualitative representations to recognize patterns of movement in NTC battle data and was made at the annual conference of the American Association of Artificial Intelligence (AAAI), one of the largest AI forums. Much of the first months of the project was spent preparing the final revisions for publication.

Another major thrust of the project was the design, specification, and implementation of a Java-based version of the visualization and plan recognition system. The multi-threading capabilities of the Java language allow the use of autonomously processes for the delivery of input data and the various calculations and displays. This allows the use of more intricate algorithms without sacrificing the performance of the visualizations. We have also created an abstract data source which will allow us to more easily integrate other data sources, such as the AHAS database, into our system. This new system incorporates hypothesis generation and ranking and be capable of performing with incomplete information, refining hypotheses over time. We have redesigned the user interface of the software to allow more complex control of the various algorithms as well as enhanced display of their output using the Java Swing User Interface components. We are also modifying the data model used by the system to provide a more realistic continuous input stream. This new input model will allow us to explore real-time issues and the generation of anytime results using partial information. Additionally, we have begun designing a comprehensive evaluation methodology in order to measure the effectiveness of our algorithms as well as perform comparison studies with alternative implementations. We have developed a plan and schedule for consultation with experts in order to further develop the plan library and conduct extensive empirical evaluations. Consultations with local Army domain experts (from GTRI) were initiated in February, to help identify a set of interesting maneuvers from a portion of our NTC data files. These maneuvers will be used to seed the plan library which will be used in the final stage of evaluation. These future evaluations will demonstrate the ability of the recognition algorithms to identify significant maneuvers in the remaining portion of our NTC data. Significant occurrences in 32 data sets were selected from our pool of NTC battle data. These events will be used to construct the pattern library which will form the basis of the comprehensive identification and recognition experiments. Analyses of the events have been used to identify the general characteristics of the data, in particular the overall size and complexity of the data as well as the number of significant events typically found in each data set.